What is claimed is:

1. A traveling wave radiating aperture, comprising:

a substantially vertical support structure;

a conducting interior structure within the support structure, having a first and second end;

a plurality of vertically arranged pairs of radiating elements, circumferentially connected to the support structure; and

radiating elements-to-interior structure couplers, cable of transferring a digital energy signal input from the first end of the interior structure to pairs of the vertically arranged radiating elements and capable of transferring an analog energy signal input from the second end of the interior structure to pairs of the vertically arranged radiating elements,

wherein the pairs of radiating elements are of substantially opposite orientation with respect to each other and on substantially opposing sides of the support structure, each pair of radiating elements being azimuthally shifted 90° from a neighboring pair of radiating elements and positioned approximately a distance of one quarter wavelength of a nominal frequency from the neighboring pair of radiating elements.

2. The radiating aperture of claim 1, wherein the pairs of radiating elements are substantially oriented 45° from an axis of the support structure and are offset from each other by approximately 90°.

3. The radiating aperture of claim 1, wherein the pair of radiating elements are excited at opposite points on the radiating elements.

4. The radiating aperture of claim 1, wherein at least one of the radiating elements is a linear dipole.

5. The radiating aperture of claim 1, wherein at least one of the radiating elements is a curved dipole.

6. The radiating aperture of claim 1, wherein at least one of the radiating elements is a bent dipole.

7. A traveling wave radiating aperture, comprising:

a substantially vertical support structure with a first and second end;

substantially horizontal support members connected at one end to the support structure;

pairs of vertically arranged radiating elements connected to another end of the respective support members; and

transmission lines feeding the radiating elements, wherein digital energy input from the first end side of the vertical support structure is radiated by the radiating elements and analog energy input from the second end side of the vertical support structure is radiated by the same radiating elements,

wherein each radiating element of the pairs of radiating elements is of substantially an opposite orientation with respect to each other, each pair of radiating elements being shifted 90° from a neighboring pair of vertically arranged radiating elements and positioned approximately a distance of one quarter wavelength of a nominal frequency from the neighboring pair of vertically arranged radiating elements, wherein sets of two pairs of radiating elements are

formed each set being approximately positioned one wavelength of the nominal frequency from another set.

8. The radiating aperture of claim 7, wherein the pairs of radiating elements are excited at opposite points of the radiating elements.

9. The radiating aperture of claim 7, wherein at least one of the radiating elements is a linear dipole.

10. The radiating aperture of claim 7, wherein at least one of the radiating elements is a curved dipole.

11. The radiating aperture of claim 7, wherein at least one of the radiating elements is a bent dipole.

12. A traveling wave radiating aperture system, comprising:

a substantially vertical support structure;

a conducting interior structure within the support structure, having a first and second end;

a plurality of vertically arranged pairs of radiating elements, circumferentially connected to the support structure;

radiating elements-to-interior structure couplers, cable of transferring a digital energy signal input from the first end of the interior structure to pairs of the vertically arranged radiating elements and capable of transferring an analog energy signal input from the second end of the interior structure to pairs of the vertically arranged radiating elements;

a digital signal transmitter; and

an analog signal transmitter,

wherein the pairs of radiating elements are of substantially opposite orientation with respect to each other and on substantially opposing sides of the support structure, each pair or radiating elements being azimuthally shifted 90° from a neighboring pair of radiating elements and positioned approximately a distance of one quarter wavelength of a nominal frequency from the neighboring pair of radiating elements.

13. The system according to claim 12, further comprising:

an isolator interposed between the analog transmitter and the conducting interior structure.

14. A traveling wave radiating structure comprising:

a vertical supporting means;

a traveling wave radiating means formed by an omni directional radiating means attached to the supporting means and a energy transmitting means within the supporting means;

digital signal generating means; and

analog signal generating mean,

wherein a digital signal from the digital signal generating means is input to a first side of the supporting means and an analog signal from the analog signal generating means is input to a second side of the supporting means, via the energy transmitting means respectively, and are radiated by the omni directional radiating means.

15. A system for transmitting hybrid analog digital signals comprising:

means for generating an analog signal;

means for generating a digital signal;

means for conveying the analog signal onto a side of a traveling wave structure;

means for conveying the digital signal onto another side of the traveling wave structure; and

means for radiating the analog signal and the digital signal via orthogonal radiators on the traveling wave structure to form an omni-directional radiation pattern.

16. A system according to claim 15, when the conveying of the digital signal is simultaneous with the radiating of the analog signal.

17. A method for transmitting hybrid analog-digital signals comprising the steps of:

generating an analog signal;

generating a digital signal;

conveying the analog signal onto a side of a traveling wave structure;

conveying the digital signal onto another side of the traveling wave structure; and

radiating the analog signal and the digital signal via orthogonal radiators on the traveling wave structure to form an omni-directional radiation pattern.

18. The method according to claim 17, when the step of conveying the digital signals is simultaneous with the step of radiating the analog signal.

19. The method according to claim 17, wherein the radiation pattern is not omni-directional.

20. The method according to claim 17, further comprising the step of:

attenuating the analog signal that is not radiated by the radiators.

21. The method according to claim 17, wherein the radiators are not orthogonal.